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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,318	03/23/2004	Yong-jin Ahn	1293.1278C4	1757

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STEIN, MCEWEN & BUI, LLP  
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WASHINGTON, DC 20005

EXAMINER
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CHOW, LIXI

ART UNIT	PAPER NUMBER
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2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/806,318

Applicant(s)

AHN ET AL.

Examiner

Lixi.Chow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10-14 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 2 and 16-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-8, 10-14 and 16-20 are pending in this application.

#### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-8, 10-14 and 16-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/806107. Although the conflicting claims are not identical, they are not patentably distinct from each other because both set of claims contain recording of recording pattern having multi-pulse and recording of erase patten having multi-pulse. Even though claim 1 and/or claim 4 in Application No. 10/806107 does not recite recording pattern and an erase pattern being alternatively and sequentially formed on the optical recording medium in response to input data having a first level and second level; however, claim 1 of Application No. 10/806107 does recite the forming of recording mark or space on the optical recording medium in response to the recording waveform. Hence, mark and space are inherently formed alternatively and sequentially on the optical recording medium in response to the different level of input data. Also, claims in Application No. 10/806107 does not recite the exact phrase of

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“cooling pulse as a portion of the first multi-pulse and another portion of the second multi-pulse”; nevertheless, Application No. 10/806107 does recite “the cooling pulse concatenating the recording and erase pattern”, wherein the recording pattern corresponds to the first multi-pulse and erase pattern corresponds to the second multi-pulse. Furthermore, the recording pattern to record mark would have different amplitude in comparison to the amplitude corresponds to the erase pattern, so mark or space can be form on the optical recording medium.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 10, 12 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara (US 6,396,792).

Regarding claim 10:

Ichihara discloses an apparatus (see Fig. 5) for forming a recording pattern and an erase pattern alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, comprising:

a recording waveform generating unit (Fig. 5, element 26) generating a recording waveform which includes first pulses to form the recording pattern in response to the first level of the input data and a second pulses including a leading pulse and a multi-pulse having corresponding high and low power levels to form the erase pattern in response to the second level of input data, wherein a power level of the leading pulse of the second pulses is equal to a power of a period between an end point of the second pulses and a start point of the first pulses (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from Pc1 to Pa, suggests that the power level of a period between an end point of the second pulses and a start point of the first pulses is equal to the leading pulse of the second pulses).

Regarding claim 12:

Ichihara discloses the apparatus of claim 10, wherein the power of the leading pulse is the high power level of the multi-pulse (see Fig. 1B).

Regarding claim 19:

Claim 19 recites similar limitations as in claim 10; hence, claim 19 is rejected under the same reasons set forth in claim 10.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1, 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (US 5,150,351; hereafter Ohno) in view of Ichihara (US 6,396,792).

Regarding claim 1:

Ohno discloses an apparatus (see Fig. 6) for forming a recording pattern and an erase pattern alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, comprising:

a recording waveform generating unit (see Fig. 6, element 8) generating a recording waveform which includes first pulses to form the recording pattern in response to the first level of the input data and second pulses including a leading pulse and a multi-pulse having corresponding high and low power levels to form the erase pattern in response to the second level of the input data, wherein a power level of the leading pulse of the second pulses is the low power level of the multi-pulse (see Fig. 4(a) and 4(b)).

Ohno fails to disclose the power level of a period between the end of the first pulses and the beginning of the second pulses is the high power level. However, Ichihara discloses an apparatus for forming a recording pattern and an erase pattern, comprising:

a recording waveform generating unit generating a recording waveform that includes a first pulses and a second pulses, wherein the second pulses includes a leading pulse and a multi-pulse having corresponding high and low power levels, and a power level of a period between an end point of the second pulses and a start point of the first pulses is the high power level of the multi-pulse (see Fig. 1B and col. 6, line 62 to col. 7, line 1; the example provided by Ichihara, i.e., the level may be changed from  $P_{c1}$  to  $P_a$ , suggests that the power level of a period between

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an end point of the second pulses and a start point of the first pulses is the high power level of the multi-pulse).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the apparatus of Ohno, so that the power level of a period between an end of the first pulses and the start of the second pulses is the high power level of the multi-pulse as suggested by Ichihara. One of ordinary skill in the art would have been motivated to do this because such power level between the end of the first pulses and the start of the second pulses will ensure the entire area in the width direction of the recording track uniformly passes the temperature zone promoting generation of crystal nuclei (see col. 7, lines 1-5).

Regarding claim 3:

Ohno discloses the apparatus, wherein the first pulses each have a first duty cycle and a first amplitude, and the second pulses each have a second duty cycle different from the first duty cycle and a second amplitude different from the first amplitude (see Fig. 4(b)).

Regarding claim 4:

Ohno discloses the apparatus, further comprising:

a pickup unit (see Fig. 6, element 5) forming a mark corresponding to the recording pattern on the optical disc in response to the first pulses and erasing another mark to form a space corresponding to the erase pattern on the optical disc in response to the second pulses (see col. 6, lines 15-31).

Regarding claim 5:

Claim 5 recites similar limitations as in claim 1; hence, claim 5 is rejected under the same reasons set forth in claim 1. In addition, Ohno also discloses a cooling pulse concatenating the

recording and erase pattern (see Fig. 4(b), the pulse in between the recording pattern and the erase pattern at power level  $P_r$  is the cooling pulse).

Regarding claim 7:

Claim 7 recites similar limitations as in claim 1; hence, claim 5 is rejected under the same reasons set forth in claim 1. In addition, Ohno also discloses a pickup (see Fig. 6, element 5) forming a mark or a space by using the generated recording and erasing waveforms.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno in view of Ichihara as applied in claim 1 above, and further in view of Clark et al. (US 5,802,031; hereafter Clark).

Regarding claim 8:

Ohno and Ichihara do not disclose the data recorded using the waveform modulated according to a Run Length Limited (RLL) (1,7). However, Clark discloses the recording of data using the waveform modulated according to a Run Length Limited (RLL) (1,7) (see Clark, col. 6, lines 51-59).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have adopted the method of recording data according to a Run Length Limited (RLL) (1,7) in the apparatus of Ohno as taught by Clark. One of ordinary skill in the art would have been motivated to do this, because recording of marks and spaces of length  $2T$  to  $8T$  for standard M-O recording system is possible (see Clark, col. 6, lines 51-59). Hence, recording of marks or spaces amongst different types of recording format can be achieved.

9. Claims 10, 11, 13, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno (US 5,150,351) in view of Furumiya et al. (US 5,490,126; hereafter Furumiya).



Regarding claim 10:

Ohno discloses an apparatus (see Fig. 6) for forming a recording pattern and an erase pattern alternatively and sequentially on an optical recording medium in response to input data having a first level and a second level, respectively, in an optical recording apparatus, comprising:

a recording waveform generating unit (Fig. 6, element 8) generating a recording waveform which includes first pulses to form the recording pattern in response to the first level of the input data and a second pulses including a leading pulse and a multi-pulse having corresponding high and low power levels to form the erase pattern in response to the second level of input data (see Fig. 4(b)), wherein a power level of the leading pulse of the second pulses is equal to a power level of an end point of the second pulses (see Fig. 4(b), the power level of a leading pulse and the power level of an end point of the second pulses are both at power level  $P_r$ ).

Ohno fails to disclose a period between an end point of the second pulses and a start point of the first pulses; however, Furumiya discloses an apparatus for forming a recording pattern and an erase pattern on an optical recording medium, wherein a power level of the leading pulse of the erase pattern is equal to a power level between an end of the erase pattern and a start point of a leading pulse of the recording pattern (see Fig. 1(b); most importantly, Furumiya teaches that the start point of a leading pulse of the recording pattern can be delayed).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the apparatus of Ohno, so that it generates a delay at the start point of the recording pulse (first pulses), thereby resulting the power level of the leading pulse of the

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second pulses to be equal to the power level of the end point of the second pulses and the start point of the first pulses as taught by Furumiya. One of ordinary skill in the art would have been motivated to do this, because the occurrence of the edge shift caused by thermal interference across a shorter space in recording, thermal nonlinearity of a short mark, and the equalization characteristics during recording can be compensated for (see col. 2, line 65 to col. 3, line 2).

Regarding claim 11:

Ohno discloses the apparatus, wherein the power of the leading pulse is the low power level of the multi-pulse (see Fig. 4(b)).

Regarding claim 13:

Ohno discloses the apparatus, wherein the multi-pulse of the erase pattern has a first pulse power and a second pulse power greater than the first pulse power, and the power of the leading pulse is equal to the first pulse power (see Fig. 4(b), the first pulse power is at  $P_r$  and the second pulse power is at  $P_b$ ).

Regarding claim 14:

Ohno discloses the apparatus, wherein the multi-pulse of the erase pattern has a first pulse power and a second pulse power greater than the first pulse power, and the power of the period before a first one of the first pulses of the recording pattern is equal to the first pulse power (see Fig. 4(b), the power of the period before a first one of the first pulses is at  $P_r$ , which is the first pulse power).

Regarding claim 20:

Claim 20 recites similar limitations as in claim 10; hence, claim 20 is rejected under the same reason set forth in claim 10 under Ohno in view of Furumiya.

*Allowable Subject Matter*

10. Claims 2 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regards to claims 2 and 16-18, none of the reference of record alone or in combination disclose or suggest a cooling pulse concatenating and including in the recording and erase pattern, and **having a cooling power level less than the power level of the leading pulse of the second pulses.**

*Response to Arguments*

11. Applicant's arguments with respect to claims 1, 3-5, 7, 8, 10-14, 19 and 20 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lixi Chow whose telephone number is 571-272-7571. The examiner can normally be reached on Mon-Fri, 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LC 12/21/06



THANG V. TRAN  
PRIMARY EXAMINER